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Taking Soil Samples

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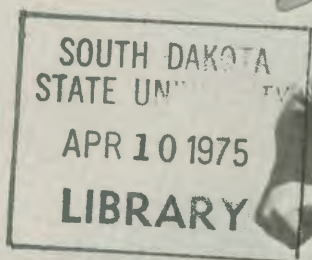
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Taking Soil Samples

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Cooperative Extension Service
South Dakota State University, Brookings
Department of Agriculture

Taking Soil Samples

By
Earl P. Adams and Edward J. Williamson,
agronomists—soils, Cooperative Extension
Service, South Dakota State University,
Brookings.

Introduction

Taking a representative sample is the most important step in soil testing. A poorly taken soil sample can result in either inadequate or excessive fertilizer use, either of which can decrease net profit. Taking probes of uniform depth and diameter from representative areas of a field will permit an accurate test.

Containers and Information Sheets

Information sheets and suitable containers for sending samples to the laboratory can be obtained from County Agents and most fertilizer dealers. Samples should be securely packaged for shipment by mail. One half pint of soil is enough for testing. Completed information sheets are an essential part of any soil test.

Sampling Tools

Sampling methods differ between various soil tests as to depth, equipment, and the way samples should be handled.

Virtually any tool is suitable for taking shallow samples, used in the conventional soil tests. Some type of closed auger or hydraulic probe, however, is best suited for taking 2-foot nitrate samples. Mounted hydraulic probes are being successfully used in the region for such deep sampling.

Conventional Soil Test Samples

The conventional test analyzes soil for organic matter, phosphorus, potassium, pH, and salt levels. These samples should be taken to a depth of 6-7 inches. Taking samples deeper for this test adversely affects the results. It has been shown that 20 probes per field taken to this depth, when combined and thoroughly mixed, give more accurate tests than when fewer probes are taken. From this 20-probe composite mixture, ap-

proximately one half pint of soil should be placed in a container and sent to the testing laboratory. A completed information sheet should also accompany samples. The preferable time for sampling is after maturation of one crop and before seeding the next one. This explains why most sampling is done in the fall or early spring.

Avoid sampling unusual field areas (very low, eroded, dead furrows, or non-representative field areas).

Nitrate Soil Test Samples

This test measures deeper reserves of readily available nitrate-nitrogen plant food. This form of nitrogen can exist in the soil root zone in large quantities yet go completely undetected by the regular organic matter nitrogen test. Samples for nitrate tests must be taken to a minimum of 2 feet. Sampling a field requires keeping the 0-6 inch probes and 6-24 inch probes separate. The normal 20 probes should be taken in each field for both the 0-6 inch and 6-24 inch depths. The 0-6 inch probes should be thoroughly

mixed, one half pint of the mixture removed and spread out on paper to air dry at room temperature. **DO NOT** place in an oven for drying. The same procedure is also followed with the 6-24 inch depth probes. Nitrate soil samples should also be taken in fall, after the crop is mature, or in early spring. A completed information sheet should be sent along with air-dried samples to the testing laboratory. **REMEMBER, Do not send moist soil samples for nitrate testing: they must be air dried first!** The same 0-6 inch surface sample can be used for conventional nitrate, and other tests, including zinc, if the sample is collected in *non-metallic* containers and air dried immediately.

Zinc-(Calcium-Magnesium) Soil Test Samples

The zinc soil test requires sampling to a depth of 6-7 inches. Again, 20 probes should be taken per field and mixed thoroughly. Approximately one-half pint of soil is then taken from the mixture

Completed information forms are essential for all soil tests and must accompany sample to laboratory.

Grower's Copy
PRESS HARD! You are making five copies
Read the instructions on the back.

**SOIL SAMPLING
INFORMATION SHEET**

Date Oct. 8 1974 Name Ross Nagel Address Brookings, S.D. Zip Code 57006

Location of farm
County Brookings Sec. 35 Twp. 110 Range 50 Extra copy to be sent to: Name _____

Soil Assoc. No. _____ Address _____

SOIL SAMPLE				SOIL DESCRIPTION								SOIL TREATMENT				Sketch field sampled for your information				
No. on bag	Lab number (do not write below)	Sample or field no.	Acres in sampled area	Level	Slope	Grade	Drainage	Position	Check if irrigated	Fertilizer applied last year 19____	Manure applied in last 2 years	Month	Analysis (10-20-10 etc.)	Lbs. per acre	Tons per acre	A B C				
1		A	40	✓				✓	✓	4/74	29-14-0	250					<div style="border: 1px solid black; padding: 10px; text-align: center;"> 1346 A B C </div>			
2		B	55	✓			✓		✓	4/74	22-22-0	200								
3		C	60	✓				✓	✓	4/74	18-46-0	100								
2-A (6-24")			B																	

PAST CROPPING HISTORY				PROPOSED CROPS				When was legume or grass last grown on this field?							
No. on bag	Two years ago	Yield	Last crop	Yield	Next crop	Desired yield	One year later	Desired yield	Year	Crop	How long as field?	Condition now or when plowed			
	Crop 19 73		Crop 19 74		Crop 19 75		Crop 19 76			Alfalfa Clover Brassica etc.		Moistly legume	Half half	Moistly grass	Height
1	Corn	65	Corn	40	Oats	80	Alfalfa	4	19 72	ALF	2	✓			14"
2	Corn	80	Corn	50	Corn	80	Corn	80	19 73						
3	Alfalfa	3.5	Alfalfa	2.0	Corn	80	Corn	80	19 74	ALF	2	✓			10"
									19 75						

Analysis Desired
Regular test (\$2.00) ☒
Zinc (corn and sorghum only, \$3.00) ☐
Nitrate (\$0.50) ☒
Other (Please Check) ☐

REMARKS: Want Nitrate test on field B only

SOIL SAMPLE EVERY TWO TO THREE YEARS.

FILL IN AS COMPLETELY AS YOU CAN

Do Not Detach. RETURN ALL FIVE PARTS. THE ORIGINAL WILL BE RETURNED TO YOU.



Several different tools (including some hydraulic equipment) can be used for taking deeper 6-24 inch as well as 0-6 inch samples.

and placed in a suitable container. *Care should be taken not to collect, mix, or send soil samples in galvanized or similar metallic containers because zinc contamination from such containers will make the results meaningless.* A good rule of thumb is to collect all soil samples in a plastic bucket.

How Often To Sample and Test Soils

Fields should be sampled and tested only once every 3 to 4 years for the conventional and zinc soil tests. Occasionally, some fields need to be resampled sooner where results from fertilizer applications do not appear to be beneficial. Nitrate samples, however, should be taken at least every other year and preferably every year where continuous cropping is practiced. Under fallow systems, nitrate samples should be taken prior to planting each crop.

General Field Sampling Guidelines

Samples should be taken only from the soil area making up the major portion of the field. Avoid the small eroded or depressional

areas. Take samples, if possible, before livestock begin grazing stubble or stalk fields, thereby avoiding sample contamination by such nutrient sources. Each past management situation should be considered as a separate field. A field having widely different soils should be divided according to these soils and each soil area sampled separately. This will permit adjustments in future fertilizer use to correct nutrient deficiencies created by previous fertility practices and/or because of inherent soil differences within a field.



Samples for the General and the Zinc Soil tests should be uniformly taken no more than 6 to 7 inches deep.

Mix separately all 0-6 inch probes in one container and all 6-24 inch probes in second container. Then remove a half pint of soil from each mixture and send to laboratory. Soil samples for nitrate-nitrogen, however, **MUST** be air dried (follow instructions under "Nitrate Soil Test Samples").





Taking samples deeper than 6-24 inches involves handling greater quantities of soil, however, only small amounts of soil at each depth are needed to give uniform samples.

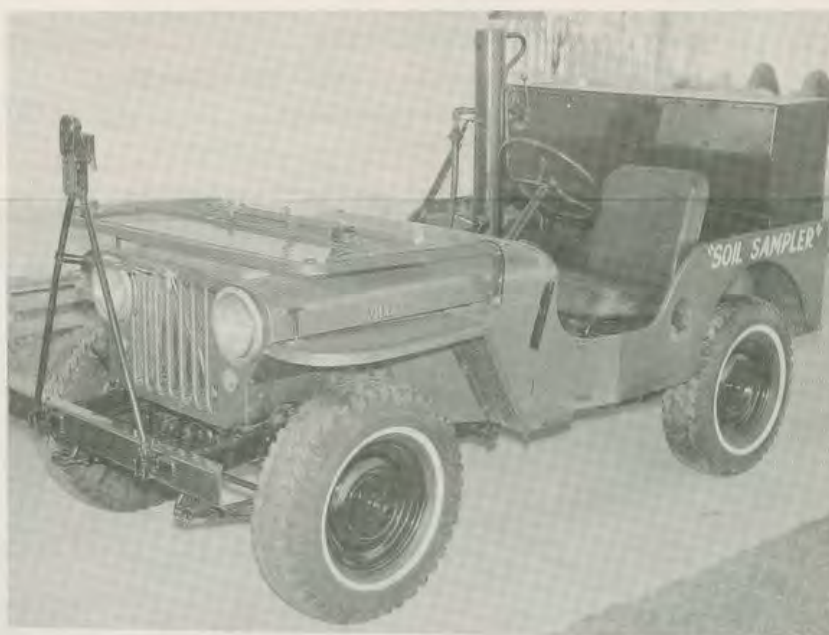
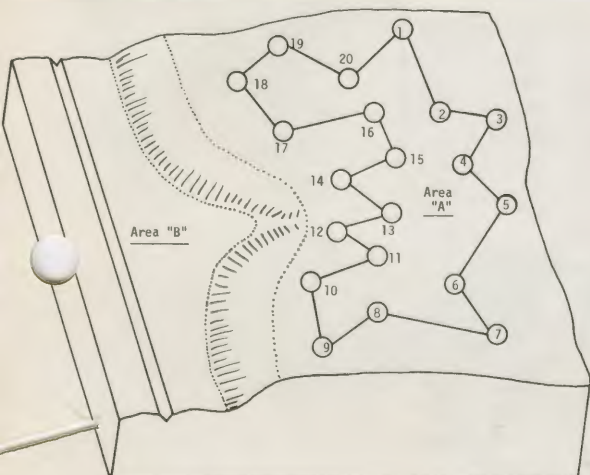


Shallow 0-6 inch surface and 6-24 inch deeper soil probes are collected separately when sampling a field.



Several designs of mobile hydraulic sampling equipment are available commercially and are well suited for taking any type soil samples. (Photo courtesy Soil Science, Inc., Fargo, N.D.)

It is important to take at least 20 probes per field to get a representative composite sample. Sample in a random manner. Avoid unusual areas or sample these separately.



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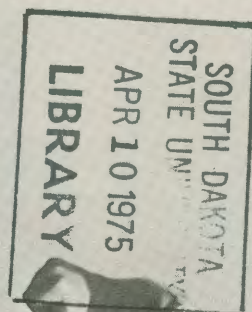
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